

NOTES UPON SURCOUF'S TREATMENT OF THE
TABANIDÆ IN THE GENERA INSECTORUM
AND UPON ENDERLEIN'S PROPOSED NEW
CLASSIFICATION OF THIS FAMILY.¹

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The Tabanidæ are a family of Diptera of considerable economic importance. They are universal in their distribution and extremely numerous in species, over 2,100 forms having been described thus far. The great majority of these bite and suck the blood of vertebrates and thus become at times very troublesome to man and his domestic animals, in addition to being actual or potential carriers of infectious diseases. Surcouf's review of the family in Wytzman's "Genera Insectorum" (Brussels, 1921, 205 pp., 5 Pls.) must therefore be greeted with satisfaction. Only those who have attempted work along similar lines can fully appreciate the amount of painstaking drudgery and first-hand knowledge involved to make such compilations of real value. Considered as a whole, Surcouf's revision is as satisfactory as it could have been made within a reasonable limit of time and it is far from my intention to present herewith unfavorable criticism. My remarks are merely prompted by the ever increasing interest these flies are assuming for medical and veterinary entomology, so that Surcouf's work is likely to be perused as a source of information by many students with little or no entomological training. It seems therefore necessary to call attention to certain omissions and errors which might easily lead astray the non-specialist.

In the introductory part Surcouf deals with the external morphology and adds certain details of internal anatomy: his researches upon the structure of the ocelli and the genitalia are presented as original work. An account of the habits of the adults, oviposition, larval and pupal stages, and enemies follows. This is supplemented by some original observations in an appendix (pp. 186-194) and also by notes under the several genera.

¹Contribution from the Department of Tropical Medicine of Harvard University Medical School.

Nevertheless the treatment of the bionomics is very inadequate and hardly does justice to our present knowledge. Thus it is stated that "the habits of *Goniops* are unknown" (p. 105), although the life-history of that genus has been worked out by W. R. Walton (Ent. News, XIX, 1908, pp. 464-465, Pl. XXII) and W. L. McAtee (Proc. Ent. Soc. Washington, XIII, 1911, pp. 21-29, Pls. I-III). Incidentally it may be mentioned that Surcouf's supposition that *Goniops* lives as an external parasite "after the fashion of *Hippobosca*" is a mere surmise not backed by any observation and highly improbable. To return to the bionomics of the family, W. Marchand has fortunately published a recent and very full account of "The Early Stages of Tabanidæ" (Monogr. of the Rockefeller Institute, New York, No. 13, 1920, 204 pp., 15 Pls.), in which the student will find all needed information. In his discussion of the parasitary specificity of tabanids (pp. 189-190), Surcouf mentions that, while most of the blood-sucking species attack mammals, *Tabanus crocodilinus* Austen and other African forms bite crocodiles and that he has himself taken a *Tabanus* in the Sahara on *Varanus griseus*. Still more remarkable, however, is the behavior of *Tabanus albipectus* Bigot, which, according to Fryer's observations in the Seychelles (Austen, Bull. Ent. Research, XI, 1920, p. 45), attacks sea-turtles, biting them between the plates of the neck.

It would be fastidious to list the errors of dates and pages which I have noticed in the bibliography, but the student should be warned against trusting the references indiscriminately.

REMARKS UPON THE GENERA

Surcouf is extremely conservative in his taxonomic treatment, since, with few exceptions, he accepts only genera that have been in use for a long time among students of the group. He retains the division into two subfamilies, Tabaninæ and Pangoniinæ, proposed more than fifty years ago by H. Læw (Die Dipteren-Fauna Südafrika's, I, 1860, pp. 14 and 31). *Thaumastocera* Grünberg he places at the end of the family as a genus of doubtful affinities, but, on account of the absence of tibial spurs, it certainly comes in the Tabaninæ, a group which,

moreover, contains several other forms with well-developed ocelli. Surcouf admits 43 genera, of which *Baikalia* (p. 39; monotypic for *B. vaillanti* Surcouf), *Guyona* (p. 141; monotypic for *Pangonia mesembrinoides* Surcouf, 1908),¹ *Brodenia* (p. 160; monotypic for *B. cinerea* Surcouf), and *Lesneus* (p. 161; monotypic for *L. canescens* Surcouf) are proposed for the first time. Unfortunately two of these new generic names are preoccupied: *Baikalia* Surcouf (not *Baicalia* v. Martens, 1876) I propose to replace by *Surcoufiella*, new name, and *Brodenia* Surcouf (not *Brodenia* Gedoelst, 1913) by *Braunsiomyia*, new name. The only species of the last-named genus, *Braunsiomyia cinerea* (Surcouf) was discovered on the sandy beach at Port Elizabeth (Algoa Bay), Cape Colony, by that enthusiastic South African entomologist Dr. H. Brauns.

Walker's subdivisions of *Pangonius* and most of Ad. Lutz' generic creations among South American tabanids are not accepted by Surcouf and many of those proposed by Ad. Lutz are not even enumerated. There are, however, a number of other generic names published previous to 1920, which have been overlooked by Surcouf and in some other cases the names he uses are obsolete or wrongly spelled.

Hexatoma Meigen, 1820 (p. 26). This name is preoccupied by *Hexatoma* Latreille, 1809, and should be replaced by *Heptatoma* Meigen, 1803, which, moreover, has many years priority.

Chrysozona Meigen, 1800 (p. 28). I cannot agree with those who claim that this name should replace *Hæmatopota* Meigen, 1803. I have recently examined an original copy, now at the Library of the American Museum of Natural History, of Meigen's pamphlet "Nouvelle Classification des Insectes Diptères" (Paris, 1800) and find that this work merely gives short generic descriptions without mentioning any species, so that these so-called genera having no genotypes should be regarded as *nomina nuda*, and therefore without nomenclatorial standing.

Lepidoselaga Osten Sacken, 1876 (p. 43). There is no sufficient reason why this amended form should be preferred to the original *Lepiselaga* Macquart, 1838.

¹*Guyona* does not appear to be generically distinct from *Orgizomyia*, as will be shown in a subsequent paper.

Dorcalæmus Austen, 1910 (p. 112). This name was originally spelled *Dorcalæmus*.

Cænoprosopon Ricardo, 1915 (p. 132). The original spelling of this name is *Cænoprosopon*.

Diclisa (p. 112) as characterized by Surcouf is not *Diclisa* Schiner, 1867, which has as genotype *Pangonia incompleta* Macquart and is evidently a synonym of *Scione* Walker, 1850. Surcouf's genus *Diclisa* appears to correspond to Enderlein's (1922) *Rhinotriclista* and *Triclista*.

Cadicera Macquart, 1855 (p. 106). As shown by Austen (Bull. Ent. Research, XI, 2, 1920, p. 140), this name should be replaced by the earlier *Phara* Walker, 1850.

Diatomineura Rondani, 1863 (p. 129). Brèthes (Bull. Soc. Ent. France, 1914, p. 59) and Austen (Bull. Ent. Research, XI, 2, 1920, p. 139) have shown that this is a synonym of the earlier *Oscia* Walker (Insecta Saundersiana, Dipt., I, 1850, p. 10).

Orgizomyia Grünberg, 1906 (p. 139). The correct spelling is *Orgizomyia*.

Pelecorrhynchus Macquart, 1850 (p. 110). This name was originally spelled *Pelecorhynchus*.

The following generic names are not listed by Surcouf:

Acanthocerella Brèthes, An. Mus. Nac. Buenos Aires, XX, 1910, p. 475. Monotypic for *A. boliviensis* Brèthes, 1910. South America.

Amphichlorops Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 166. Type: *Tabanus flavus* Wiedemann, 1828. South America.

Anacampta Schiner, Verh. Zool. Bot. Ges. Wien, XVII, 1867, p. 305. Without description or species. Evidently an error for *Apocampta* Schiner.

Catachlorops Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 166. Type: *Dichelacera fuscipennis* Macquart, 1847. South America.

Chelotabanus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 166. Type: *Tabanus fuscus* Wiedemann, 1819. South America.

Chlorotabanus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 167. Type: *Tabanus mexicanus* Linnæus, 1767. North and South America.

Cænura Bigot, Ann. Soc. Ent. France, (3) V, 1857, p. 286. Monotypic for *C. longicauda* Bigot, 1857. Chile. A number of species have been described, all of which have been omitted by Surcouf.

Cryptotylus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 166. No species mentioned. South America.

Cydistomyia Taylor, Proc. Linn. Soc. New South Wales, XLIV, 1919, p. 47. Monotypic for *C. doddi* Taylor, 1919. Queensland.

Di cladocera Ad. Lutz, Comm. Linhas Telegr. Estr. de Matto Grosso ao Amazonas, Ann. No. 8, Zool., Taban., 1912, p. 4. Monotypic for *Di cladocera unicolor* Ad. Lutz, 1912.

Dyspangonia Ad. Lutz, Revista Soc. Scientif. Sao Paulo, I, 1, 1905, p. 27. Type: *Pangonia fuscipennis* Wiedemann, 1828. This is a synonym of *Esenbeckia* Rondani.

Erephosis Bigot, Mém. Soc. Zool. France, IV, 1891, p. 414. Misspelling of *Erephopsis*.

Esenbackia Surcouf, Bull. Mus. Hist. Nat. Paris, XV, 1909, p. 257. Misspelling of *Esenbeckia*.

Gonisops Kertész, Catal. Tabanid., 1900, p. 25. Evidently a misspelling of *Goniops*.

Holococeria Ricardo, Arch. f. Naturgesch., LXXX, Abt. A, Heft 8, (1914) 1915, p. 128. A misspelling of *Holcoceria*.

Laphriopsis Ad. Lutz, Mem. Inst. Osw. Cruz, III, 1911, p. 71. An evident error for *Laphriomyia*.

Leptotabanus Ad. Lutz and A. Neiva, Mem. Inst. Osw. Cruz, VI, 1914, p. 72. The name is used in an enumeration of species for *Leptotabanus nigrovenosus* Ad. Lutz and A. Neiva, but I was unable to find a description of either genus or species.

Leucotabanus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 167. Type: *Tabanus leucaspis* Wiedemann, 1828. South America.

Macroormus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 167. Type: *Tabanus sorbillans* Wiedemann, 1828. South America.

Melanotabanus Ad. Lutz and A. Neiva, Mem. Inst. Osw. Cruz, VI, 1914, p. 76. Monotypic for *M. fuliginosus* Ad. Lutz and A. Neiva, 1914. South America.

Metoponaplos Ricardo, Arch. f. Naturgesch., LXXX, Abt. A, Heft 8, (1914) 1915, p. 124. Type by original designation: *Pangonia parva* Walker, 1848. According to Enderlein (Mitt. Zool. Mus. Berlin, X, 2, 1922, p. 342), this is a synonym of *Scarphia* Walker, 1850, a view with which I fully concur.

Merycomyia Hine, Ohio Naturalist, XII, 1912, p. 515. Type by original designation: *Tabanus whitneyi* Johnson, 1904 (Syn.: *Merycomyia geminata* Hine, 1912). North America.

Neochrysops Walton, Proc. Ent. Soc. Washington, XX, 1918, p. 191. Monotypic for *N. globosus* Walton, 1918. North America.

Neotabanus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 167. Type: *Tabanus trilineatus* Latreille, 1814. South America. Ad. Lutz (Ibidem, p. 47) claims that his generic name has priority over *Neotabanus* Ricardo, 1911, but I have been unable to discover on what evidence this statement is based.

Orthostylus Ad. Lutz and A. Neiva, Mem. Inst. Osw. Cruz, VI, 1914, p. 74. Monotypic for *O. ambiguus* Ad. Lutz and A. Neiva, 1914. South America.

Palimmecomyia Taylor, Proc. Linn. Soc. New South Wales, XLII, 1917, p. 518. Monotypic for *P. celænosspila* Taylor, 1917. Queensland.

Parosilvius Ferguson, Proc. Roy. Soc. Victoria, N. S., XXXIII, 1921, p. 8. Monotypic for *P. fulvus* Ferguson, 1921. Australia.

Phæomyia Ad. Lutz, Mem. Inst. Osw. Cruz, III, 1911, p. 83. Evidently a misspelling for *Phæoneura*.

Phæotabanus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 168. Type: *Tabanus litigiousus* Walker, 1850. South America.

Phibalomyia Taylor, Proc. Roy. Soc. Victoria, N. S., XXXII, 2, 1920, p. 165. New name for *Elaphromyia* Taylor (Proc. Linn. Soc. New South Wales, XLI, 1917, p. 749), not of Bigot, 1859. Monotypic for *Elaphromyia carteri* Taylor, 1917. Queensland.

Philorites Cockerell, Entomologist, XLI, 1908, p. 264. Monotypic for *P. johannseni* Cockerell, 1908. Fossil in the Eocene of Colorado.

Rhabdotylus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 166. Type: *Tabanus planiventris* Wiedemann, 1828. South America.

Pæcilosoma Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 167. Type: *Tabanus quadripunctatus* Fabricius, 1805. South America.

Rhigioglossa Wiedemann, Aussereurop. Zweifl. Ins., I, 1828, p. 105. Used in the combination "*Rhigioglossa testacea*" as a synonym of *Rhinomyza edentula* Wiedemann, which thus will be its genotype. The name takes precedence over *Erodiorhynchus* Macquart, 1838, based upon the same species.

Rhynomyza Surcouf, Bull. Mus. Hist. Nat. Paris, XV, 1909, p. 260. Misspelling of *Rhinomyza*.

Stenotabanus Ad. Lutz, Mem. Inst. Osw. Cruz, VI, 1914, p. 167. Type: *Tabanus taniotes* Wiedemann, 1828. South America.

Stictotabanus Ad. Lutz and A. Neiva, Mem. Inst. Osw. Cruz, VI, 1914, p. 72. The name is used in an enumeration of species for *Stictotabanus maculipennis* (Macquart). Since this is a described species the generic name has a standing in nomenclature, even though the genus has apparently not been hitherto defined.

In the case of the new generic names proposed by Ad. Lutz in Mem. Inst. Osw. Cruz, VI, 1914, pp. 166-168, the only published descriptions are contained in a key and are not accompanied by references to species. In a previous article by Lutz and Neiva, however, which appeared in the same volume (pp. 69-80), these new names have been used in enumerations of species and I have selected genotypes from among them. *Cryptotylus* alone has apparently not yet been used in connection with a specific name so that it still is a *nomen nudum*. Ad. Lutz also closes his article with the statement (p. 168) that it was published before (in 1913) in the Brazilian journal "Brazil Medico." I have been unable to discover whether his new generic names should therefore be properly dated from 1913, but it would appear that they were not used in connection with specific names previously to 1914. Many of Ad. Lutz' proposed genera have not been noticed in the Zoological Record.

The following additional genera of Tabanidæ are of more recent date:

Heterochrysops Kröber, Zool. Jahrb., Abt. f. Syst., XLIII, 1920, p. 55. For a number of Palaearctic species of *Chrysops*, none of which is designated as type. *Chrysops flavipes* Meigen, 1804, is herewith selected as such.

Neochrysops Szilády, Ann. Hist. Nat. Mus. Hungarici, XIX, 1922, p. 126. Type by original designation: *Neochrysops grandis* Szilády, 1922, Formosa. The name is preoccupied by *Neochrysops* Walton, 1918.¹ The genus, however, appears doubtfully distinct from *Chrysops* and need therefore not be renamed at present.

Silviochrysops Szilády, Ann. Hist. Nat. Mus. Hungarici, XIX, 1922, p. 126. Monotypic for *Silviochrysops flavescens* Szilády, 1922, Formosa.

Surcoufia Kröber, Arch. f. Naturgesch., LXXXVIII, Abt. A, Heft 8, 1922, p. 115. Monotypic for *Surcoufia paradoxa* Kröber, 1922, Northwest Africa.

Finally in a recent paper which will be considered in detail below, Enderlein has proposed a considerable number of new generic names. These it appears unnecessary to list at present, since their exact status is as yet uncertain.

REMARKS UPON NORTH AMERICAN SPECIES.

Among the misspellings of names, I mention only those of *Chrysops nigribimbo* Whitney (not *nigrilimbo*) and *Tabanus superjumentarius* Whitney (not *suberjumentarius*).

Tabanus lugubris Osten Sacken appears to belong properly in the genus *Snowiellus*, from examination of a specimen obtained at Tampa, Florida, by Mr. E. Bell.

Tabanus whitneyi Johnson belongs in the genus *Merycomyia*.

Tabanus mexicanus. The synonymy and distribution given by Surcouf under that name should be revised. As shown by F. Knab (*Insecutor Inscitiæ Menstruus*, IV, 1916, pp. 95-100), four species have been commonly confused under *mexicanus*:

¹*Neochrysops* Bethune-Baker, Trans. Ent. Soc. London, (1922) 1923, p. 279, in Lepidoptera, is similarly preoccupied.

(1) *Tabanus mexicanus* Linnæus (Syn.: *T. olivaceus* de Geer and *T. punctatus* Fabricius). Mexico, Central America, Trinidad.

(2) *Tabanus inanis* Fabricius (Syn.: *T. ochroleucus* Meigen, *T. viridiflavus* Walker, and perhaps also *T. sulphureus* Palisot de Beauvois). South and Central America.

(3) *Tabanus flavus* Macquart. Southeastern United States: from New Jersey to Florida, Missouri and Louisiana. This name is unfortunately preoccupied by *Tabanus flavus* Wiedemann and no substitute appears to be available.

(4) *Tabanus luteoflavus* Bellardi (Syn.: *T. mexicanus* var. *limonus* Townsend). Mexico.

The following North American species have been omitted:

Chrysops calopterus Hine, Ohio Naturalist, VI, 1905, p. 392, ♀. Guatemala.

Chrysops hinei Daecke, Ent. News, XVIII, 1907, p. 143, ♀. New Jersey.

Chrysops parvulus Daecke, Ent. News, XVIII, 1907, p. 142, ♀. New Jersey.

Merycomyia geminata Hine, Ohio Naturalist, XII, 1912, p. 515, Pl. XXV, figs. 2 and 4, ♀ ♂. This is a synonym of *Merycomyia whitneyi* (Johnson).

Merycomyia mixta Hine, Ohio Naturalist, XII, 1912, p. 516, Pl. XXV, figs. 1 and 3, ♀. Georgia, North America.

Neochrysops globosus Walton, Proc. Ent. Soc. Washington, XX, 1918, p. 192, fig. I, ♀. Eastern United States (Maryland).

Silvius jonesi Cresson, Proc. Ac. Nat. Sc. Philadelphia, LXXI, 1919, p. 175, ♀ ♂. California.

Tabanus subniger Coquillett, Ent. News, XVII, 1906, p. 48, ♀. Illinois.

Tabanus atratus var. *fulvopilosus* Johnson, Psyche, XXVI, 1919, p. 164, ♀. Florida, New Jersey.

A number of additional species of *Tabanus* have been described by J. McDunnough in 1921 and 1922 (Canad. Entom., LIII, 1921, pp. 139-144 and LIV, 1922, p. 239), namely: *T. atrobasis*, *T. laniferus*, *T. metabolus*, *T. nudus*, *T. rupestris*, and *T. trepidus*; and this author has also reinstated *Tabanus calif-*

ornicus Marten and *T. hæmaphorus* Marten as valid species. More recently Hine (Canad. Entom., LV, 1923, pp. 143-146) has added *T. gracilipalpis* and *T. sexfasciatus*.

Including these, we obtain a total of 334 species of Tabanidæ known at present from America north of Panama. They are divided among the several genera as follows: *Apatolestes*, 1; *Chrysops*, 71; *Hæmatopota*, 3; *Corizoneura*, 4; *Diachlorus*, 1; *Diatomineura*, 4; *Dichelacera*, 6; *Rhinotriclista* (*Diclisia* of Surcouf), 1; *Erephopsis*, 2; *Esenbeckia*, 1; *Goniops*, 1; *Lepiselaga*, 1; *Merycomyia*, 2; *Neochrysops*, 1; "*Pangonius*,"¹ 18; *Pityocera*, 1; *Scione*, 2; *Silvius*, 4; *Snowiellus*, 2; *Stibasoma*, 2; and *Tabanus*, 206. Of these *Goniops*, *Merycomyia*, *Neochrysops*, and *Snowiellus* are restricted to the Nearctic region (north of Mexico).

It may still be mentioned that Surcouf (p. 130) erroneously quotes *Trichophthalma amæna* Bigot and *Hermoneura landbecki* Philippi among the synonyms of *Diatomineura latipalpis* (Macquart), having evidently followed in this Kertész (Cat. Dipt., III, 1908, p. 170). Both Bigot's and Philippi's descriptions refer, however, to a nemestrinid which should be known as *Eurygastromyia landbecki* (Philippi). See Lichtwardt, Deutsch. Ent. Zeitschr., 1910, p. 608.

REMARKS UPON ETHIOPIAN SPECIES

Tabanus corax Læw, Wien. Ent. Monatschr., VII, 1863, p. 10. Surcouf (p. 79) lists this as a doubtful synonym of *Tabanus pluto* Walker. Neave (Bull. Ent. Research, V, 1915, p. 308), however, has shown that Læw's name should be used for *Tabanus xanthomelas* Austen, of which *T. leucaspis* v. d. Wulp (not of Wiedemann) is a synonym.

Tabanus alboventralis Newstead is recorded twice in the list (p. 59), the first time misspelled "*albiventralis*." It is apparently a synonym of *T. suftis* Jænnicke.

¹Whether there any true *Pangonius*, in the restricted sense, in North America appears extremely doubtful. The three species which I have examined, viz., *tranquilla* Osten Sacken, *rasa* Osten Sacken, and *fera* Williston present all the characters of Austen's genus *Buplex*, to which, I believe, they should be transferred.

Tabanus blanchardi Surcouf and *T. gabonensis* Macquart are still listed as distinct species, whereas they are now generally regarded as synonyms of *T. secedens* Walker.

Hæmatopota maculosifacies Austen is listed twice (p. 34); also erroneously as *maculifacies* Austen.

Pangonius brevis Austen (p. 127) belongs properly in the genus *Phara* (*Cadicera*).

Pangonius austeni J. Bequaert (p. 127). This name should be deleted from the list. As stated by Austen (*Ann. Mag. Nat. Hist.*, (8) XI, 1913, pp. 560-562), it was based upon the male of *P. infuscus* Austen and the female of *Diatomineura neavei* Austen. I have convinced myself of the correctness of Major Austen's view after he has kindly compared some of my specimens with the types of these two species, during my recent visit at the British Museum.

Pangonius neavei J. Bequaert (p. 128) should also be dropped since it is not Austen's *Diatomineura neavei*, but was based on both sexes of *Corizoneura inornata* Austen, as I have recognized after comparison with the types.

In my paper on Congo tabanids, *Rev. Zool. Afr.*, II, 1913, p. 222, I have also recorded a male *Chrysops fusca* and a female *C. distinctipennis*. As Major Austen has pointed out to me at the British Museum, both specimens belong to *Chrysops stigmatalis* Lœw. On the other hand, *Diatomineura virgata* Austen, *Dorcalæmus candidolimbatus* Austen, and *D. compactus* Austen of the same paper were correctly identified.

I have noticed the following misspellings of names: *Hæmatopota heptogramma* for *H. heptagramma*; *H. hirsutitarsis* for *H. hirsutitarsus*; *Tabanus nyassæ* for *T. nyasæ*; and *T. wosnami* for *T. woosnami*.

The following Ethiopian species have been omitted:

Hæmatopota furva Austen, *Bull. Ent. Research*, III, 1912, p. 334, Pl. XI, fig. 7, ♀ ♂. Uganda and Kenya Colony.

Hæmatopota pertinens Austen, *Ann. Mag. Nat. Hist.*, (8) I, 1908, p. 423, ♀. Nyasaland, Rhodesia, Northern Nigeria.

Hæmatopota picta Surcouf, *Bull. Muséum Paris*, XIV, 1908, p. 155, ♀. Abyssinia.

Hæmatopota schoutedeni (Surcouf) = *Chrysozona schoutedeni* Surcouf, Rev. Zool. Afric., I, 1911, p. 89, ♀. Belgian Congo.

Hinea distincta Ricardo, Arch. f. Naturgesch., LXXX, Abt. A, Heft 8, (1914) 1915, p. 126, ♀. Cameroon.

Diatomineura neavei Austen, Bull. Ent. Research, I, 1911, p. 279, ♀ ♂. Katanga.

Pangonius leucomelas Wiedemann, Aussereurop. Zweifl. Insekt., I, 1828, p. 90, ♀. Cape of Good Hope.

Pangonius oldii Austen, Ann. Mag. Nat. Hist., (8) I, 1908, p. 215, ♀ ♂. Nyasaland.

Tabanus zoulouensis (Bigot) = *Atylotus zoulouensis* Bigot, Mém. Soc. Zool. France, V, 1892, p. 647, ♀. Cape Colony.

Tabanus ugandæ "Ricardo" Surcouf, Bull. Muséum Paris, XIII, 1907, p. 41, has apparently not been described.

Silvius callosus Ricardo, Ann. South African Mus., XVII, 1920, p. 529, ♀ ♂. South Africa.

Silvius hirsutus Ricardo, Ann. South African Mus., XVII, 1920, p. 529, ♀ ♂. South Africa.

Professor J. S. Hine and I have recently completed a check-list of African Tabanidæ. We find that, after various additions and corrections, the total number of species at present described from the Ethiopian region is 422, divided among 23 genera as follows: *Adersia*, 1; *Aegophagamyia*, 1; *Braunsiomyia* (= *Brodenia*), 1; *Buplex*, 8; *Chrysops*, 30; *Dorcalæmus*, 6 (and 1 variety); *Hæmatopota* (including *Austenina*, *Holcoceria*, and *Parhæmatopota*), 118; *Hippocentrum*, 5; *Hinea*, 3; *Lesneus*, 1; *Nuceria* (= *Corizoneura*), 17; *Orgizomyia* (including *Guyona* and *Thriambeutes*), 4; *Osca* (= *Diatomineura*), 2 (and 1 variety); *Pangonius*, 35 (and 1 variety); *Phara* (= *Cadicera*), 15; *Protonopes*, 2; *Rhigioglossa* (= *Erodiorrhynchus*), 1; *Rhinomyza*, 9; *Scarphia* (= *Metoponaplos*), 2; *Silvius* (including *Mesomyia*), 12; *Subpangonia*, 2; *Tabanus*, 145 (and 10 varieties); and *Thaumastocera*, 2. The Malagasy region possesses only 28 species, viz., *Aegophagamyia*, 2; *Bowierella*, 12; *Chrysops*, 4; *Orgizomyia*, 1; *Rhinomyza*, 5; and *Tabanus*, 4. Of these genera *Adersia*, *Aegophagamyia*, *Bowierella*, *Braunsiomyia*, *Dorcalæmus*,

Hinea, *Lesneus*, *Orgizomyia*, *Phara*, *Pronopes*, *Rhigioglossa*, *Scarphia*, *Subpangonia*, and *Thaumastocera* are precinctive.

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The Tabanidæ are a very natural and remarkably uniform group of flies, and, whereas there has never been any doubt as to the limits of the family, its further subdivision is much more difficult.

Lœw's arrangement into two subfamilies has been generally adhered to and entomologists have been slow in recognizing the new generic divisions that have been proposed from time to time. This is clearly shown by the unsuccessful attempts at splitting up the extensive genus *Tabanus*, of which about 1150 species are known at present. In 1909, Ad. Lutz (*Zool. Jahrb' Suppl.*, X, p. 624) proposed raising Lœw's subfamilies to the rank of major divisions. The *Opisthacanthæ*, with tibial spurs at the hind tibiæ, he divided into three subfamilies: *Pangoniinæ*, *Silviinæ*, and *Chrysopinæ*. The *Opisthanoplæ*, without tibial spurs, also formed three subfamilies: *Diachlorinæ*, *Lepiselaginæ*, and *Tabaninæ*. Among the *Tabaninæ* he further distinguished the *Tabaninæ haploceræ*, with toothed third antennal joint, and the *Tabaninæ schistoceræ*, with branched third antennal joint. Ad. Lutz' subdivisions, however, have not all been very clearly defined and, as they were evidently based on a study of South American insects only, they have not been accepted by other entomologists.

Quite recently Enderlein has come forward with a much more pretentious scheme of classification, intended to be of universal application.¹ He also adopts Lœw's two major subdivisions of the family, for which he uses the names proposed by Ad. Lutz.

In the *Opisthacanthæ* he recognizes four subfamilies separable as follows:²

¹G. Enderlein. Ein neues Tabanidensystem. *Mitt. Zool. Mus. Berlin*, X, 2, 1922, pp. 333-351.

²Throughout his key Enderlein uses the word "Fühlergeißel" for the third antennal segment and not for the terminal style, but I have corrected this oversight.

Tabaninæ: *Stibasoma*, *Dichelacera*, *Dasyommia*, *Selasoma*, *Snowiellus*, *Hybomitra*, *Therioplectes*, *Tabanus*, *Atylotus*, *Lepiselaga*, (and *Merycomyia*, which was not known to Enderlein).

Diachlorinæ: *Diachlorus*.

Hæmatopotinæ; *Hæmatopota*.

A commendable feature of Enderlein's work is the designation of genotypes, though in some cases they are manuscript names of as yet undescribed species. Unfortunately the author has evidently failed to inquire whether types had not been previously selected for some of the older genera. Since this is likely to cause some confusion in the future, I may point out some of the cases I have noticed.

Diachlorus Osten Sacken. The genotype is *Tabanus bicinctus* Fabricius, as designated by Coquillett (1910); not *Tabanus ferrugatus* Fabricius as given by Enderlein.

Dichelacera Macquart. The type of this genus is *Dichelacera unifasciata* Macquart, as designated by Coquillett (1910); Enderlein gives *Tabanus cervicornis* Fabricius.

Corizoneura Rondani. The type of this genus is *Tanyglossa æthiopica* Thunberg (Syn.: *Pangonia appendiculata* Macquart), as designated by Coquillett (1910) and again by Austen in 1920 (Bull. Ent. Research, XI, p. 139). Enderlein's genus *Corizoneura*, with *Pangonia angustata* Macquart as type, is entirely different and its characters seem to agree with those of *Buplex* Austen (Type: *Pangonia suavis* Læw), a genus evidently overlooked by Enderlein.

Erephopsis Rondani. The genotype is *Pangonia fulvithorax* Wiedemann, as designated by Coquillett (1910). Enderlein gives *Tabanus guttatus* Donovan.

Lilæa Walker. *Pangonia lurida* Walker was designated as type by Coquillett (1910). Enderlein gives as such *Pangonia ræi* King.

Melpia Walker. *Pangonia fulvithorax* Wiedemann, is the genotype designated by Coquillett in 1910, which makes this generic name a strict synonym of *Erephopsis* Rondani. *Melpia* Enderlein, with *Melpia exeuns* Walker as type, if really generically distinct from *Erephopsis*, will need a new name.

Nemorius Rondani. Monotypic for *Chrysops vitripennis* Meigen, as originally proposed by Rondani. Enderlein gives *N. singularis* Meigen as type.

Nuceria Walker. *Pangonia longirostris* Hardwicke was designated as type by Coquillett in 1910. Enderlein gives as such *Tabanus rostratus* Linnæus.

Ommatiosteres Enderlein. Enderlein gives as type of this new genus *Pangonia bifasciata* Wiedemann, and places it in the Melpiinæ, which, according to his key, have the first posterior cell open. *P. bifasciata*, however, has been thus far placed among the *Pangonius* with the first posterior cell closed.

Pangonius Latreille. Latreille (1810) and Coquillett (1910) designated *Tabanus proboscideus* Fabricius, 1794 (= *Pangonia maculata* Fabricius, 1805) as the type. Enderlein gives as such *Tabanus marginatus* Fabricius, which was not among the species mentioned by Latreille when he originally proposed the genus.

Philoliche Wiedemann. Coquillett designated *Tabanus rostratus* Linnæus as type in 1910, so that *Nuceria* Enderlein (not of Walker) is an exact synonym of *Philoliche*. Enderlein's *Philoliche*, however, with *Tabanus angulatus* Fabricius as type, is entirely different.

Siridorhina Enderlein. This is an exact synonym of *Nuceria* Walker (not of Enderlein), since both have the same genotype: *Pangonia longirostris* Hardwicke. To judge from the characters given in Enderlein's key, both *Siridorhina* Enderlein and *Nuceria* Walker appear to equal *Corizoneura* Rondani and indeed Austen includes *Pangonia longirostris* Hardwicke in *Corizoneura* as defined by him in Bull. Ent. Research, XI, 1920, p. 139. The genus should be known as *Nuceria* Walker, since that name has several years priority.

In his introduction Enderlein mentions several genera whose descriptions were not accessible to him. There are, unfortunately, a number of others which have also been overlooked, for instance such a well-known type as *Goniops* Aldrich.

Enderlein's paper was issued as a preliminary account, pending the publication of a more comprehensive revision of the tabanid genera. Meanwhile it is difficult to judge of the validity

or usefulness of the many subfamilies, tribes, and genera which he adopts, the more so since several of his new genera are based upon undescribed species. The real test as to whether these groups are natural divisions or merely based upon artificial combinations of characters will come when Enderlein attempts to classify all or at least the majority of the described species. Unless this test is satisfactorily met, it is difficult to see how Enderlein's work will not merely add to the intricacy of an already overburdened taxonomy.